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EXAMINER

DEPUMPO, DANIEL G

ART UNIT PAPER NUMBER

3611

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/824,980
Filing Date: April 03, 2001
Appellant(s): WILLIAMS ET AL.

MAILED

JUL 30 2004

GROUP 3600

Michael Wiggins
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/1/04.

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(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

No amendment after final has been filed. It is noted that the paper filed 12/12/03 was titled as an amendment, however, this paper did not request any amendment to the specification or claims.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 1-23 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

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(9) Prior Art of Record

4,896,089	Kliman	1-1990
6,049,153	Nishiyama	4-2000
5,691,591	McCann	11-1997
6,389,678	Ackermann	5-2002
6,020,661	Trago	2-2000
4,149,309	Mitsui	4-1979

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5 and 8 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Kliman et al. in view of Applicant's Admitted Prior Art (APA) and further in view of Nishiyama et al. '153.

Kliman discloses the use of a switched reluctance motor (col. 1, line 51 and col. 2, line 19) in a power steering system (col. 2, line 37). (In paper number 6, mailed 6/18/02, it is noted that this was inadvertently indicated as being at *col. 1, line 37*.) Regarding the insulation layer (claim 4), this is considered to be admitted prior art because the examiner's taking of official

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notice has not been challenged. The use of insulation would have been obvious to avoid shorting out the motor.

Kliman does not disclose the details of the steering system, including a steering wheel, worm gear and worm. However, at page 1 of applicant's disclosure (APA), it is admitted that these elements are typical in a steering system. It would have been obvious to use these elements in the steering system of Kliman since Kliman is silent regarding the specific details of the steering system and since APA discloses these elements are typical in a steering system. Kliman also does not disclose the use of sensorless techniques to sense rotor position (claims 8 and 22), however, APA discloses (page 4, lines 6-17) that such techniques are known. It would have been obvious to use such techniques to "reduce manufacturing costs and misalignment problems" (APA, page 4, lines 6 and 7).

Kliman also does not teach a stator made of segment assemblies that include a stack of plates. However, a review of the prior art of record, for example Nishiyama, shows that this is common in the motor art. As shown in figs. 1 and 4 (of Nishiyama), the stator is made of segment assemblies that include a stack of plates. Also as shown in fig. 1, the stator assemblies include a radially outer rim section 6 and tooth section 5 having projections extending from the radially inner end of the tooth section. It would have been obvious to modify Kliman by making the stator of segment assemblies having the shape taught by Nishiyama so that the winding may be formed easily (col. 4, line 49). This would have also been obvious since this is extremely common in the motor art.

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2. Claims 9-13, 16-19, 22 and 23 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kliman, APA and Nishiyama as applied to claims 1-5 and 8 above, and further in view of McCann and Ackermann.

As set forth above, the combination teaches substantially all that is claimed. Although Nishiyama teaches the use of a segmented stator so that the winding may be formed easily, the reference does not discuss the "slot fill". McCann, however, discloses the benefits and desirability of increasing the "slot fill" (e.g. col. 5, lines 55-67) in a "switched reluctance motor with indirect position sensing" (title). McCann does not specifically disclose the actual percentages of slot fill desired. Ackermann also discloses the benefits and desirability of high slot fills, and discloses that motor slot fills approaching 70% are common (col. 2, line 16) in the prior art. Ackermann further discloses that their method obtains slot fills "substantially higher than the slot fills obtainable with prior art techniques" (col. 6, lines 42-45) which results in decreased cost and stack height (col. 7, lines 61-67). It would have been obvious to use greater slot fill amounts since McCann teaches related benefits such as improved thermal characteristics and reduced vibration in a switched reluctance motor. Moreover in view of Ackermann, to use a slot fill greater than 70% would have been obvious to decrease cost and stack height.

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3. Claim 6 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kliman, APA and Nishiyama et al. as applied to claims 1-5, 8-13, 16-19 and 22 above, and further in view of Trago et al.

As set forth above, the combination teaches substantially all that is claimed, but does not teach end caps. However, Trago discloses a similar motor including end caps 25 and 26. It would have been obvious to include end caps, as taught by Trago, to protect the stator.

4. Claims 14 and 20 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kliman, APA, Nishiyama, McCann and Ackermann as applied to claims 9-13, 16-19, 22 and 23 above; and further in view of Trago et al.

As set forth above, the combination teaches substantially all that is claimed, but does not teach the use of end caps. However, Trago discloses a similar motor including end caps 25 and 26. It would have been obvious to include end caps, as taught by Trago, to protect the stator.

5. Claim 7 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kliman, APA and Nishiyama et al. as applied to claims 1-5, 8-13, 16-19 and 22 above, and further in view of Mitsui.

As set forth above, the combination teaches substantially all that is claimed, but does not teach the use of deformations to hold the stator plates together. However, Mitsui discloses a similar motor including deformations 17 (i.e. fig. 6). It would have been obvious to include such deformations, as taught by Mitsui, to define interlocking means between successive laminations (col. 3, line 20) of stator plates. To form the deformations by using slits would have been an obvious design expedient.

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6. Claims 15 and 21 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kliman, APA, Nishiyama, McCann and Ackermann as applied to claims 9-13, 16-19, 22 and 23 above, and further in view of Mitsui.

As set forth above, the combination teaches substantially all that is claimed, but does not teach the use of deformations to hold the stator plates together. However, Mitsui discloses a similar motor including deformations 17 (i.e. fig. 6). It would have been obvious to include such deformations, as taught by Mitsui, to define interlocking means between successive laminations (col. 3, line 20) of stator plates. To form the deformations by using slits would have been an obvious design expedient.

(11) Response to Argument

Initially it is noted that the claims recite that the steering system includes a "*switched reluctance motor*". The claims, however, do not recite any structure that is specific to a switched reluctance motor. It appears that uniqueness of such a motor lies in the control circuitry and the drive circuitry of the motor, and not in the structure of the motor itself. See paragraph 4 of appellant's specification. The claims do not recite any structure of the control circuitry or drive circuitry. Consequently, it appears that the structure of the *claimed* motor is merely that of a common motor. Nevertheless, as set forth in the rejection, the Kliman reference expressly teaches the use of a *switched reluctance motor* in a *power steering system*.

At page 4 of the brief, appellant urges that the Examiner has *falsely* asserted that "Kliman discloses the use a of switched reluctance motor (col. 1, line 51 and col. 2, lines 19) in a power steering system (col. 1, line 37)." As stated above, the examiner notes that the disclosure of the power steering system is at col. 2, line 37 of Kliman.

At page 5, appellant urges that the instant specification outlines the reason why traditional switched reluctance electric machines are not implemented in power steering systems. However, the examiner notes that Kliman teaches the use of a switched electric motor in a power steering system.

Appellant notes that switched reluctance motors are old and that motors with segmented stators are old. Apparently appellant considers that it would not have been obvious to combine these features because the technology is old. This argument is not persuasive because it has been held that "contentions that the reference patents are old is not impressive absent a showing that the art tried and failed to solve the same problem notwithstanding its presumed knowledge of the references". *In re Neal*, 179 USPQ 56 (CCPA 1973). Appellant has not established that the art tried and failed to solve the same problem. Moreover, it is noted that the applied references to Kliman (patented January 23, 1990) and Nishiyama (patented April 11, 2000) are not "old".

Regarding the use of sensorless control techniques, appellant notes that there are known problems relating to these techniques. However, appellant concedes that such techniques are known in a switched reluctance motor (spec., page 4, lines 6-17). The examiner considers that it would have been obvious to use sensorless control techniques to "reduce manufacturing costs and misalignment problems" (spec., page 4, lines 6 and 7). Appellant discusses the problems associated with direct sensor systems, and then states that there is significant interest in the

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sensorless approach (remarks filed 3/6/03 page 12). Appellant seems to be providing strong reasons why one of ordinary skill in the art would have looked to sensorless systems. Moreover, since appellant's specification specifically discloses that the prior art recognizes the benefits of the sensorless approach (page 4, lines 6 and 7), it is not understood how applicant can now argue that this modification would not have been obvious.

Appellant argues (page 7) that there is no motivation to combine the teachings of Kliman and Nishiyama. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine these references has been expressly provided by Nishiyama, as stated in the rejection. As set forth in the rejection, the motivation to make the stator of segment assemblies having the shape taught by Nishiyama is so that the winding may be formed easily (Nishiyama col. 4, line 49). Moreover, the rejection notes that the use of stator segments is extremely common in the motor art.

Appellant further argues that it is unclear why one of ordinary skill in the art would look to Nishiyama, and alleges that Nishiyama relates to a different type of machine. It appears that applicant considers Nishiyama to be nonanalogous art. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed.

Cir. 1992). In this case, the examiner considers that the field of applicant's endeavor comprises electric motors in general, and deems it to be well within the realm of obviousness to look to various types of electric motors. Moreover, the examiner notes that Nishiyama is directed to a motor that utilizes "*reluctance torque*" (abstract). Therefore, this motor is not a "different" type of machine, considering the fact that the claims do not recite any specific structure of the motor that limits it to a switched reluctance type (i.e. the claims do not recite the motor driver or controller). Furthermore, appellant has provided no evidence indicating why one of ordinary skill would only look to switched reluctance type motors, and would disregard the teachings of all other motor types. The examiner notes that the standard of "ordinary skill in the art" suggests some level of skill, rather than a lack thereof.

In response to appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

At page 9, appellant again urges that none of the prior art references are directed toward power steering systems. To the contrary, Kliman specifically discloses this.

Regarding the slot fills, McCann discloses the benefits and desirability of increasing the "slot fill" (e.g. col. 5, lines 55-67) in a "switched reluctance motor with indirect position sensing" (title). McCann does not specifically disclose the actual percentages of slot fill desired.

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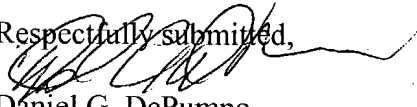
Ackermann also discloses the benefits and desirability of high slot fills, and discloses that motor slot fills approaching 70% are common (col. 2, line 16) in the prior art. Ackermann further discloses that their method obtains slot fills "substantially higher than the slot fills obtainable with prior art techniques" (col. 6, lines 42-45) which results in decreased cost and stack height (col. 7, lines 61-67). It would have been obvious to use greater slot fill amounts since McCann teaches related benefits such as improved thermal characteristics and reduced vibration in a switched reluctance motor. Moreover in view of Ackermann, to use a slot fill greater than 70% would have been obvious to decrease cost and stack height.

Regarding the end caps, appellant urges that Trago does not teach or suggest end caps and retainer sections for individual stator segment cores of a stator (brief, page 12). The examiner notes that this language does not appear in the claims. The end caps of Trago have the structure of the end caps as broadly claimed.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,


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Primary Examiner
Art Unit 3611

dgd

July 28, 2004

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